Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

AIR FORCE MEDICS IMPROVE NAVIGATION TIME WITH 3-D AUDIO

Technology that delivers quick, effective positional information about an injured or missing person will help save time and lives. When combined with positional data for team members and targets, three-dimensional (3-D) audio displays provide an alternative to visual displays with positional situational awareness when eyes and hands are task loaded.

Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

Testing of the 3-D audio prototype began with a subject panel in the laboratories of the Human Effectiveness Directorate's Crew System Interface Division located at Wright-Patterson Air Force Base, Ohio. Additional tests were conducted with Air Force medics in a semi-operational environment field exercise.

During the Air Force medics' annual field training, the 3-D audio navigation cueing interface resulted in a dramatic reduction in navigation time when compared to the traditional navigation methodology featuring maps, compasses, and step counting. The 3-D audio symbology uses headphones, head tracking, a Global Positioning System, and digital audio processing to simulate externalized range through voice-based distance cueing and bearing cueing. Post-experiment survey results indicated an overwhelming preference and desire for fielding the 3-D audio cueing technology.

Background

Two units of Air Force medics performed land navigation tasks during a daylight field exercise in fully wooded conditions. The 3-D audio system, developed by the directorate's Battlespace Acoustics Branch, was measured against the medics' current land navigation procedure (map, compass, and step counting). The dependent variable during the field exercise was the time it took the medics to cross to a waypoint—the place between major points on a route. Results showed a dramatic decrease in navigation time with the 3-D audio cueing technology compared to the current land navigation system.

Full demonstrations of the technology were also held at the annual Phoenix Warrior exercise. According to a Phoenix Warrior trip report, users were able to navigate strictly by audio both day and night after a short training period. The technology also allowed users to put their heads down and focus on foot placement and terrain, thereby enhancing user safety.

Human Effectiveness
Emerging Technology

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-HE-02)